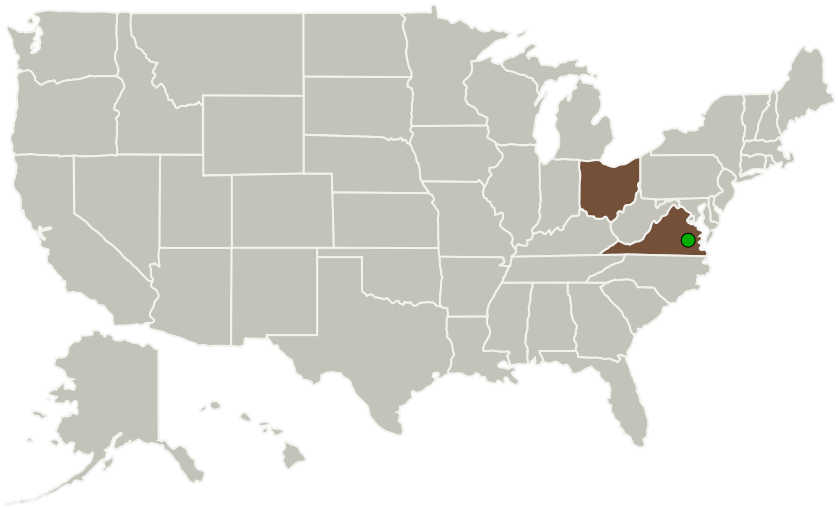
Smart Tooling for Manufacturing Composites, Phase II

Completed Technology Project (2011 - 2015)

Project Introduction

CRG's shape memory polymer (SMP) tooling technologies, Smart Tooling, offer cutting-edge manufacturing solutions that can meet the construction needs of all future composite platforms and systems. Development and implementation of Smart Tooling, Smart Mandrels and SMP Bladders, offers end users significant opportunities to save direct expense for tooling cost and manufacturing labor to fabricate complex geometry and trapped composites. CRG's concept for a high temperature mandrel product is to leverage a proven Smart Mandrel process and replace the current material system with a novel SMP capable of remaining rigid at the 350 F laminate cure temperatures then softening following cure for extraction.

Primary U.S. Work Locations and Key Partners



Organizations Performing Work	Role	Type	Location
Cornerstone Research Group, Inc.	Lead Organization	Industry	Miamisburg, Ohio
Langley Research Center(LaRC)	Supporting Organization	NASA Center	Hampton, Virginia

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Primary U.S. Work Locations	
Ohio	Virginia

Project Transitions

June 2011: Project Start

March 2015: Closed out

Closeout Documentation:

- Final Summary Chart*(https://techport.nasa.gov/file/139468)*

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Organization:

Cornerstone Research Group, Inc.

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:

Jason L Kessler

Program Manager:

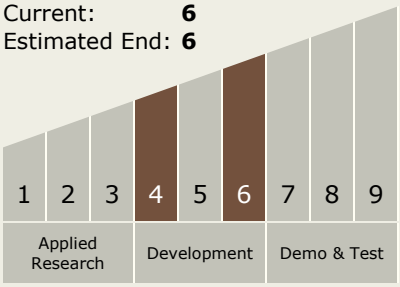
Carlos Torrez

Principal Investigator:

Michael D Rauscher

Technology Maturity (TRL)

Start: **4**
Current: **6**
Estimated End: **6**



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Technology Areas

Primary:

- TX12 Materials, Structures, Mechanical Systems, and Manufacturing
  - TX12.4 Manufacturing
    - TX12.4.2 Intelligent Integrated Manufacturing

Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System